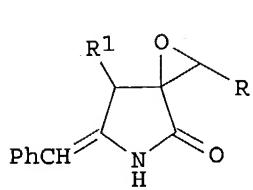


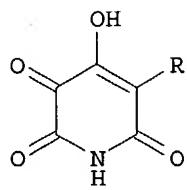
11/26/04

ANSWER 1 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

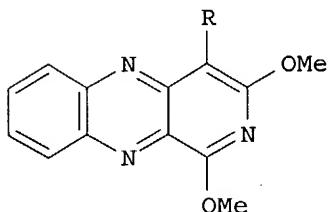
GI



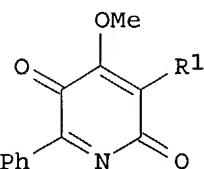
I



II



III



IV

AB Ozonolysis of the pyrrolidinediones I (R = Ph, 4-ClC₆H₄; R¹ = :O) afforded the pyrrolidinetriones, which in the presence of Lewis acids were converted into maleimide derivative Analogously, ozonolysis of the pyrrolidinones I (same R; R¹ = OH) gave the pyrrolidinediones, which were converted into the pyridinetriones II (same R) via Lewis acid catalyzed isomerization to yield the trihydroxypyridones and ensuing air oxidation In solution two tautomeric forms of the pyridinetriones II may exist, both of which represent hydroxy azabenzozuquiones. In two steps compds. II were transformed into azaquinone derivs. III. Representatives of another type of azaquinones are compds. IV (R¹ = CO₂Me, H). The azaquinone IV (R¹ = CO₂Me) reacted easily with acidic compds. or with 2-butenal.

IT 548736-16-9P 548736-21-6P 548736-45-4P

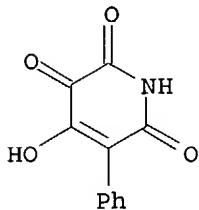
548736-47-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation of azabenzozuquones by ring-expansion reactions)

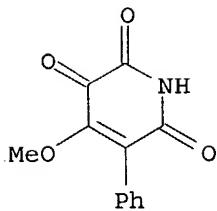
RN 548736-16-9 CAPLUS

CN 2,3,6(1H)-Pyridinetrione, 4-hydroxy-5-phenyl- (9CI) (CA INDEX NAME)

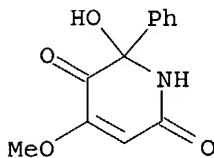


RN 548736-21-6 CAPLUS

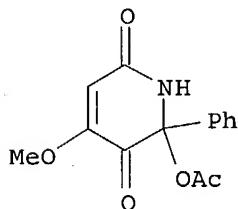
CN 2,3,6(1H)-Pyridinetrione, 4-methoxy-5-phenyl- (9CI) (CA INDEX NAME)



RN 548736-45-4 CAPLUS
 CN 2,5-Pyridinedione, 1,6-dihydro-6-hydroxy-4-methoxy-6-phenyl- (9CI) (CA
 INDEX NAME)

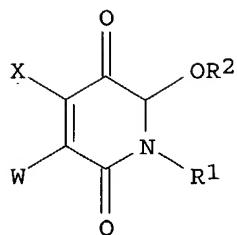


RN 548736-47-6 CAPLUS
 CN 2,5-Pyridinedione, 6-(acetyloxy)-1,6-dihydro-4-methoxy-6-phenyl- (9CI)
 (CA INDEX NAME)

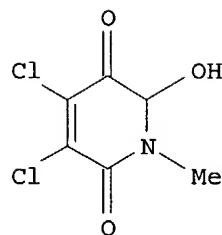


ACCESSION NUMBER: 2003:195519 CAPLUS
 DOCUMENT NUMBER: 139:69126
 TITLE: New azabenzzoquinones by ring-expansion reactions
 AUTHOR(S): Poschenrieder, H.; Stachel, H.-D.; Wiesend, B.;
 Polborn, K.
 CORPORATE SOURCE: Department Pharmazie / Zentrum fur Pharmaforschung,
 Universitat Munchen, Munchen, D 81377, Germany
 SOURCE: Journal of Heterocyclic Chemistry (2003), 40(1), 61-69
 CODEN: JHTCAD; ISSN: 0022-152X
 PUBLISHER: HeteroCorporation
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 139:69126
 REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 2 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
 GI



I

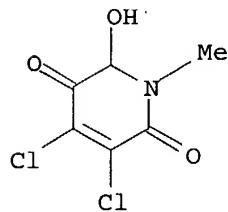


II

AB Title compds. I [R1 = H, alk(en/yn)yl, cycloalkyl, cycloalkenyl, aryl, aralkyl, heterocyclyl, heterocyclylalkyl; R2 = H, alk(en/yn)yl, cycloalkyl, cycloalkenyl, aryl, aralkyl, acyl, heterocyclyl, heterocyclylalkyl; W, X = H, halo] were prepared. Dichloroacetyl chloride was reacted with N-methylformamide at reflux for a couple of hours. The crude reaction mixture was mixed with NaHCO₃ and the product isolated by continuous extraction with ether and II was isolated and purified by distillation in vacuo in 40% yield. Addnl. expts. showed the isolation of intermediates in the process, e.g., (Z)-2,3-dichloro-4-(N-formyl-N-methylamino)-4-oxobut-2-enoic acid and 3,4-dichloro-2-(N-methylformamido)-5-dichloroacetoxyfuran (characterized). II at 400 mg/kg (mice) showed the following tumor growth inhibition/tumor/cancer: 92%/MAC 13/colon, 97%/M5076/ovarian and 81-86%/MAC15/colon. I are anti-proliferative agents, especially tumor growth inhibitors and anti-cancer agents, antibiotics and/or antiviral agents.

IT 458523-68-7P
 RL: PAC (Pharmacological activity); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
 (antiproliferative agents)

RN 458523-68-7 CAPLUS
 CN 2,5-Pyridinedione, 3,4-dichloro-1,6-dihydro-6-hydroxy-1-methyl- (9CI) (CA INDEX NAME)



ACCESSION NUMBER: 2002:716252 CAPLUS
 DOCUMENT NUMBER: 137:232564
 TITLE: Preparation of dioxodihydropyridine derivatives as antiproliferative agents
 INVENTOR(S): Ayuko, Washington Odur; Tisdale, Michael John; Lattmann, Eric
 PATENT ASSIGNEE(S): EPX Research Limited, UK
 SOURCE: PCT Int. Appl., 34 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

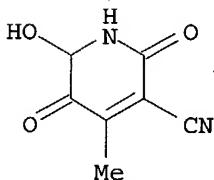
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002072553	A1	20020919	WO 2002-GB1119	20020312

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
 CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
 GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
 LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,
 PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,
 UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU,
 TJ, TM
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
 GB 2373246 A1 20020918 GB 2001-6137 20010313
 CA 2441001 AA 20020919 CA 2002-2441001 20020312
 EP 1377551 A1 20040107 EP 2002-704961 20020312
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
 BR 2002008101 A 20040302 BR 2002-8101 20020312
 US 2004106648 A1 20040603 US 2003-662555 20030915
 PRIORITY APPLN. INFO.: GB 2001-6137 A 20010313
 WO 2002-GB1119 W 20020312
 OTHER SOURCE(S): MARPAT 137:232564
 REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 3 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
 GI

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The title photog. material has ≥ 1 layer containing compound I-V (X1 = O, S, SO₂, NR₁(R₁ = H, alkyl, aryl, heterocyclyl); L1-15 = methine; n1-5 = 0-1; Z = non-metallic atoms required to form aromatic ring; Y = alkylsulfonyl, arylsulfonyl, aryloxycarbonyl, carbamoyl; R₂ = aryl; R₃ = R₁; when R₃ = aryl, R₄ = aryloxycarbonyl, acylamino, ureido, carboxy, carbamoyl, cyano, hydroxy, alkoxy, aryloxy, amino, sulfamoyl, sulfone amido; when R₃ = H, alkyl, heterocyclyl, R₄ = H, alkyl, aryl, heterocyclyl, alkoxy carbonyl or group defined above for R₄; R₅-7 = organic group; X₂₋₄ = O, S; R₈, R₉ = H, alkyl, aryl, heterocyclyl; each compound of I-V containing at least 1 of carboxy, sulfone amido, or sulfamoyl).
 IT 167014-99-5
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparing specific compound for photog. material)
 RN 167014-99-5 CAPLUS
 CN 3-Pyridinecarbonitrile, 1,2,5,6-tetrahydro-6-hydroxy-4-methyl-2,5-dioxo-(9CI) (CA INDEX NAME)

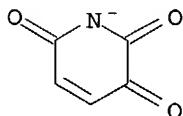


ACCESSION NUMBER: 1995:629937 CAPLUS
 DOCUMENT NUMBER: 123:156260
 TITLE: Silver halide photographic material with greatly improved residual color on super rapid processing
 INVENTOR(S): Yamada, Taketoshi; Oonishi, Akira; Usagawa, Yasushi
 PATENT ASSIGNEE(S): Konishiroku Photo Ind, Japan

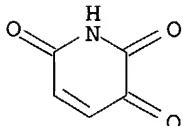
SOURCE: Jpn. Kokai Tokkyo Koho, 50 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06317878	A2	19941115	JP 1993-108410	19930510
PRIORITY APPLN. INFO.:			JP 1993-108410	19930510

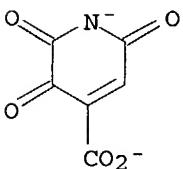
L3 ANSWER 4 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
AB In situ radiolysis of hydroxypyridones in aqueous solution produces several radicals detected by ESR. These are produced by primary and secondary reactions of hydroxyl radicals. Azaquinoidal structures were detected from 3- and 5-hydroxypyridones.
IT 59273-22-2P 129223-43-4P 129223-44-5P
129223-45-6P.
RL: PRP (Properties); FORM (Formation, nonpreparative); PREP (Preparation) (formation and ESR of)
RN 59273-22-2 CAPLUS
CN 2,3,6(1H)-Pyridinetrione, ion(1-), radical ion(1-) (9CI) (CA INDEX NAME)



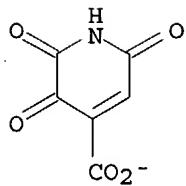
RN 129223-43-4 CAPLUS
CN 2,3,6(1H)-Pyridinetrione, radical ion(1-) (9CI) (CA INDEX NAME)



RN 129223-44-5 CAPLUS
CN 4-Pyridinecarboxylic acid, 1,2,3,6-tetrahydro-2,3,6-trioxo-, ion(2-), radical ion(1-) (9CI) (CA INDEX NAME)

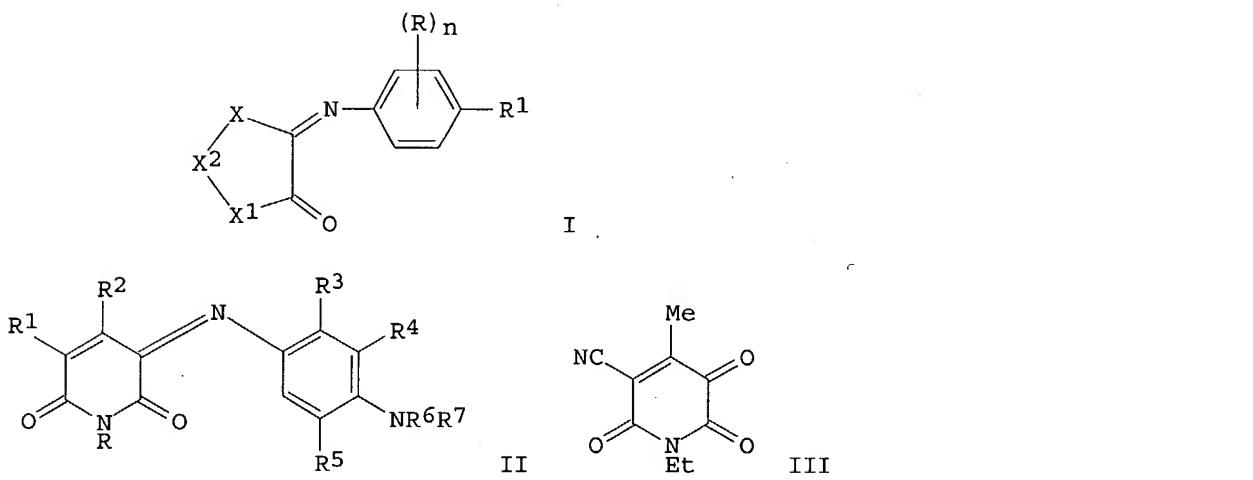


RN 129223-45-6 CAPLUS
CN 4-Pyridinecarboxylic acid, 1,2,3,6-tetrahydro-2,3,6-trioxo-, ion(1-), radical ion(1-) (9CI) (CA INDEX NAME)



ACCESSION NUMBER: 1990:514498 CAPLUS
 DOCUMENT NUMBER: 113:114498
 TITLE: In-situ radiolysis ESR studies of hydroxypyridones
 AUTHOR(S): Icli, Siddik
 CORPORATE SOURCE: Dep. Chem., Ege Univ., Izmir, Turk.
 SOURCE: Tetrahedron (1990), 46(8), 2891-902
 CODEN: TETRAB; ISSN: 0040-4020
 DOCUMENT TYPE: Journal
 LANGUAGE: English

L3 ANSWER 5 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
 GI



AB A process for reproducing a Ag image in a layer of photog. material
 comprises contacting the Ag image with an aqueous acid solution of a compound
 which

can be reduced by the Ag to form a reducing agent, in the presence of a Ag complexing agent, causing an imagewise diffusion of the reducing agent to a layer which comprises an azamethine dye I (R = substituent; n = 0-3; R1 = NH2, substituted NH2, OH; X, X1, X2 and the 2 C atoms to which X and X1 are joined = optionally substituted coupler moiety). Preferred I are hydroxypyridone dyes II [R = H, optionally substituted (o.s.) alkyl, aralkyl, cycloalkyl, aryl, heterocyclyl, o.s. NH2; R1 = H, CN, CO2R8, CONR8R9, SO3H, SO3-, COR8; R2 = H, OH, CN, CO2R10, CONR10R11, COR10 (R8, R9, R10, R11 = H, o.s. alkyl, aralkyl, cycloalkyl, aryl, heterocyclyl); R3, R4, R5 = H, halo, o.s. alkyl or cycloalkyl, alkoxy; R6, R7 = H, o.s. alkyl, aralkyl, cycloalkyl, aryl, heterocyclyl; NR6R7 = 5- or 6-membered heterocycle; R4R6N and NR6R7 form 2 N-containing heterocyclic rings]. The process is used to reproduce an image in an old photograph on a new support. Thus, an assembly was prepared which comprised a 150- μ -thick transparent cellulose triacetate film support coated with 10 mg compound II (R = Et, R1 = CN, R2 = R6 = R7 = Me, R3 = R4 = R5 = H)/dm² dispersed in 30

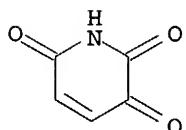
mg gelatin/dm². A strip of this assembly and a strip of a Ag image print of a bar chart (0.11-10 line pairs/mm) were immersed 10 s in 100 mL 0.25N HCl containing 10 mg pyridinetrione III as auxiliary catalyst, dissolved in 0.5 mL EtO(CH₂)₂OH. The coatings were then contacted by passing them face-to-face through a pair of rubber rollers at 5 ft/min. After 1 min, there was total bleaching in the areas corresponding to Ag, and the response at 10 lines/mm was 88%.

IT 13445-17-5D, derivs.

RL: CAT (Catalyst use); USES (Uses)
(catalysts, for use in reproduction of old photographs on new support bases)

RN 13445-17-5 CAPLUS

CN 2,3,6(1H)-Pyridinetrione (9CI) (CA INDEX NAME)



ACCESSION NUMBER: 1981:470987 CAPLUS
DOCUMENT NUMBER: 95:70987
TITLE: Reproduction of photographic material using coupled hydroxypyridone azamethine dyes
INVENTOR(S): Wood, Glenn Peter; Long, William Edward; Thomas, Patrick David Pryce
PATENT ASSIGNEE(S): Ciba-Geigy A.-G., Switz.
SOURCE: Brit. UK Pat. Appl., 14 pp.
CODEN: BAXXDU
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
GB 2047419	A	19801126	GB 1980-9867	19800324
GB 2047419	B2	19830518		
PRIORITY APPLN. INFO.:			GB 1979-10540	A 19790326

L3 ANSWER 6 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

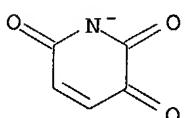
AB The oxidation of hydroxy-2-pyridones by one-electron oxidants was studied and intermediate free radicals observed by ESR spectroscopy. In alkaline media azasemiquinones arising from electron transfer, solvation, and oxidative coupling processes were detected. ESR hyperfine splittings are assigned with the aid of Me substitution and spin ds. explained by considering N perturbation. In acid solution N-protonation produces structural changes in the semiquinone nucleus which affect spin d. distributions. The apparent lifetimes of the radical species can be correlated with their expected tendencies to direct free radical dimerization.

IT 59273-22-2 59273-23-3 59273-24-4

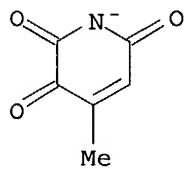
RL: PRP (Properties)
(ESR hyperfine splitting consts. of)

RN 59273-22-2 CAPLUS

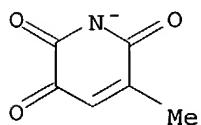
CN 2,3,6(1H)-Pyridinetrione, ion(1-), radical ion(1-) (9CI) (CA INDEX NAME)



RN 59273-23-3 CAPLUS
CN 2,3-Pyridinedione, 6-hydroxy-4-methyl-, ion(1-), radical ion(1-) (9CI)
(CA INDEX NAME)



RN 59273-24-4 CAPLUS
CN 2,3-Pyridinedione, 6-hydroxy-5-methyl-, ion(1-), radical ion(1-) (9CI)
(CA INDEX NAME)



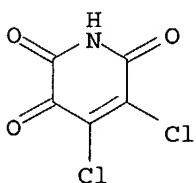
ACCESSION NUMBER: 1976:134745 CAPLUS
DOCUMENT NUMBER: 84:134745
TITLE: Electron spin resonance studies of azasemiquinone free radical intermediates in the oxidation of hydroxypyridones
AUTHOR (S): Ashworth, P.
CORPORATE SOURCE: Dep. Chem., Univ. York, York, UK
SOURCE: Tetrahedron (1976), 32(2), 261-7
CODEN: TETRAB; ISSN: 0040-4020
DOCUMENT TYPE: Journal
LANGUAGE: English

L3 ANSWER 7 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
GI For diagram(s), see printed CA Issue.

AB The pyridine I (R = H) was halogenated with HBr and HCl to give I (R = Br, Cl). I (R = Cl).HCl was hydrolyzed with HCl to give II. I and COCl₂ gave III. I and ClCN gave IV.

IT 57892-51-0P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reaction with thionyl chloride)

RN 57892-51-0 CAPLUS
CN 2,3,6(1H)-Pyridinetrione, 4,5-dichloro- (9CI) (CA INDEX NAME)



ACCESSION NUMBER: 1976:43770 CAPLUS
DOCUMENT NUMBER: 84:43770
TITLE: Trihalogenated aminopyridinols
AUTHOR (S): Alt, K. O.; Christen, Edgar; Weis, Claus D.
CORPORATE SOURCE: Dyestuffs Chem. Dep., Ciba-Geigy Corp., Basel, Switz.

SOURCE: Journal of Heterocyclic Chemistry (1975), 12(4), 775-8
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CODEN: JHTCAD; ISSN: 0022-152X
OTHER SOURCE(S): CASREACT 84:43770

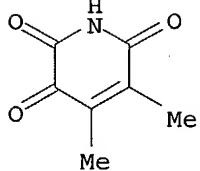
L3 ANSWER 8 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
AB 4-methyl-2,3,6-trihydroxypyridine, 5-methyl-2,3,6-trihydroxypyridine (I), and 4,5-dimethyl-2,3,6-trihydroxypyridine were prepared. I was obtained from 3-hydroxy-6-methyl-2-aza-1,4-benzoquinone (II); the other 2 compds., by literature methods. Their uv and N.M.R. spectra are reported. They undergo CH OH-tautomerism. The compds. undergo rapid autoxidn. to the corresponding azaquinones. Autoxidn. of I leads to II in quant. yield.

IT 19365-33-4P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

RN 19365-33-4 CAPLUS

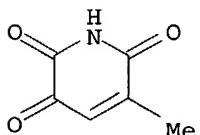
CN 2,3,6(1H)-Pyridinet

CH₂Cl₂ (100), Pyridine, 1,3-dimethyl (50), (CA INDEX NAME)



ACCESSION NUMBER: 1968:467192 CAPLUS
DOCUMENT NUMBER: 69:67192
TITLE: Methyl-substituted 2,3,6-trihydroxypyridines and their
oxidation products
AUTHOR (S): Knackmuss, Hans Joachim
CORPORATE SOURCE: Max-Planck-Inst. Med. Forsch., Heidelberg, Fed. Rep.
Ger.
SOURCE: Chemische Berichte (1968), 101(8), 2679-89
CODEN: CHBEAM; ISSN: 0009-2940
DOCUMENT TYPE: Journal
LANGUAGE: German

L3 ANSWER 9 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
 GI For diagram(s), see printed CA Issue.
 AB The bromate oxidation of 5-amino-3-methyl-2-pyridone gave 3-hydroxy-6-methyl-2-aza-1,4-benzoquinone 4-(2,6-dihydroxy-5-methylpyridyl-3-imine) (I). Treating I with concentrated HNO₃ gave 3-hydroxy-6-methyl-2-aza-1,4-benzoquinone. Hydrogenation and oxidation gave 4,4'-dihydroxy-5,5'-dimethyl-3,3'-diaza-2,2'-diphenoxquinone (II).
 IT 17999-44-9P 28518-43-6P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of)
 RN 17999-44-9 CAPLUS
 CN 2,3,6(1H)-Pyridinetrione, 5-methyl- (9CI) (CA INDEX NAME)

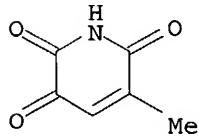


RN 28518-43-6 CAPLUS
CN Glutaconimide, 2-methyl-4-oxo-, mono(phenylhydrazone) (8CI) (CA INDEX)

NAME)

CM 1

CRN 17999-44-9
CMF C6 H5 N O3



CM 2

CRN 100-63-0
CMF C6 H8 N2

H₂N-NH-Ph

ACCESSION NUMBER: 1968:104928 CAPLUS
DOCUMENT NUMBER: 68:104928
TITLE: Structure and properties of the oxidation product of 5-amino-3-methyl-2-pyridone
AUTHOR (S): Knackmuss, Hans J.
CORPORATE SOURCE: Max-Planck-Inst. Med. Forsch., Heidelberg, Fed. Rep. Ger.
SOURCE: Chemische Berichte (1968), 101(4), 1148-53
CODEN: CHBEAM; ISSN: 0009-2940
DOCUMENT TYPE: Journal
LANGUAGE: German

L3 ANSWER 10 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

GI For diagram(s), see printed CA Issue.

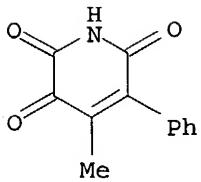
AB cf. preceding abstract The unsatd. acyldiazabicyclic ketones (I and II) are converted by heating in methanol to the acylpyrrolinones (III) and 6-acylamidopyridines (IV). In aqueous base I and its methoxy analog give (V) and its 6-methoxy analog, resp., which are readily converted to the pyridone (VI). The benzoyl ketone II in aqueous base gives predominately enamino ketone AccPh:CHNH₂ (VII), with a small amount of VI. Mechanisms for these reactions and for the thermal conversion of II to the uretidine (VIII) are proposed. Initial fragmentation of I and II is suggested to give the azetinone (IX) which is then attacked by water or methanol to give intermediates that undergo cyclizations or fragmentations leading to III, IV, V, and VII. Recyclization of IX leads to VIII.

IT 10137-16-3P

RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

RN 10137-16-3 CAPLUS

CN 2,3-Pyridinedione, 6-hydroxy-4-methyl-5-phenyl- (6CI, 8CI) (CA INDEX
NAME)



ACCESSION NUMBER: 1967:403026 CAPLUS
 DOCUMENT NUMBER: 67:3026
 TITLE: Heterocyclic studies. XXV. Rearrangements of 2-acyl-1,2-diazabicyclo[3.2.0]-3-hepten-6-ones in methanol and in base
 AUTHOR(S): Moore, James Alexander; Wineholt, Robert L.; Marascia, Frank J.; Medeiros, Robert W.; Creegan, Francis J.
 CORPORATE SOURCE: Univ. of Delaware, Newark, DE, USA
 SOURCE: Journal of Organic Chemistry (1967), 32(5), 1353-60
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 OTHER SOURCE(S): CASREACT 67:3026

L3 ANSWER 11 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
 AB 2-Amino-5-nitropyridine (10 g.) and 22 g. BzCl in 100 cc. C5H5N warmed 45 min., poured into aqueous Na₂CO₃, and steam distilled, and the distillation residue filtered gave 17 g. 2-benzamido-5-nitropyridine, tan needles, m. 167°; a 10-g. portion in 180 cc. glacial AcOH hydrogenated 15 min. over 500 mg. 10% Pd-C, treated with 7.2 cc. concentrated HCl, and filtered, the residue extracted with EtOH, and the extract (75 cc.) diluted with 750 cc. Et₂O gave 7.5 g. 5-amino-2-benzamidopyridine-2HCl (I.2HCl), m. 220-30°; I.2HCl neutralized with aqueous NaHCO₃ gave I, m. 141-2° (H₂O containing a trace of Na₂S₂O₄). I.2HCl (1.0 g.) in 5 cc. 20% HCl treated at 0° with 0.28 g. NaNO₂ in 3 cc. H₂O, kept 15 min. at 0°, treated with urea, added during 0.5 hr. at 95° to 50 cc. 20% HCl, basified, treated with BzCl, and filtered, and the residue treated in H₂O with C and added to 5N HCl gave 2-benzamido-5-hydroxypyridine-HCl (II.HCl), m. 215-20°, which with NaHCO₃ yielded 425 mg. II, m. 181-2° (MeOH), pK'A 2.6, 8.8 (50% MeOH). II (100 mg.) in 5 cc. aqueous K₂CO₃ shaken with 3 drops BzCl yielded 130 mg. 3-benzoate (III) of II, needles, m. 148-9° (MeOH). III hydrolyzed with KOH-MeOH gave 85% II, m. 180-2°. II (3.0 g.) in 10 cc. EtOH containing 0.015 mole NaOEt refluxed 2.5 hrs. with 0.93 cc. EtBr and evaporated in vacuo, the solid residue dissolved in aqueous K₂CO₃, and the product isolated with Et₂O gave 900 mg. 5-EtO analog (IV) of II; the aqueous solution neutralized yielded 1.75 g.

unchanged II; the crude IV refluxed 2 hrs. with concentrated HCl, washed with Et₂O, and evaporated gave 350 mg. (crude) 2-amino-5-ethoxypyridine-2HCl (V.2HCl), m. 143-5°, which with NaHCO₃ in the presence of a trace of Na₂S₂O₄ yielded V, m. 47-8°; picrate, yellow needles, m. 240-1°. V (10 mg.) refluxed with Ac₂O and evaporated gave 8 mg. 2-AcNH analog of V, needles, m. 108-9° (EtOH). 3-Hydroxypyridine (VI) and 11.2 g. KOH in 500 cc. H₂O treated simultaneously with 0.2 mole p-O₂NC₆H₄N₂Cl (VII) and 58 g. KOH in 1 l. H₂O during 20 min., stirred 1 hr., treated with 50 cc. glacial AcOH, and filtered, and the crude coupling product (44.6 g.) fractionally crystallized from EtOH gave 3 fractions of 5-hydroxy-2-(p-nitrobenzeneazo)pyridine (VIII), violet needles, m. 213-30°; red needles, m. 231-2°; orange needles, m. 214-26°; the orange form recrystd. from EtOH gave orange-red needles, m. 231-2°. VIII (25 g.) in 150 cc. glacial AcOH hydrogenated 0.5 hr. at 45 lb. over 0.3 g. 10% Pd-C, the mixture treated under N with 48 cc. 48% HBr and filtered, the residue washed with AcOH, the combined AcOH solns. evaporated in vacuo, the residue dissolved in H₂O,

basified with Na_2CO_3 , shaken with 34 g. BzCl in the presence of a trace of SnCl_2 , and filtered, the residue hydrolyzed with $\text{KOH}-\text{MeOH}$, the mixture concentrated, acidified with HCl , and filtered, and the residue washed with

Et_2O

gave 20.5 g. $\text{II} \cdot \text{HCl}$, m. 215-20°. VIII (2.5 g.) in 250 cc. concentrated HCl and 150 cc. MeOH treated with 25 g. SnCl_2 in small portions, warmed on the steam bath, basified with 50% aqueous KOH , and evaporated, the residue dissolved in 25 cc. iced H_2O , treated with sufficient 50% aqueous KOH to dissolve the Sn salts, and shaken with 10 cc. BzCl at 0-5°, and the organic phase washed with H_2O , kept overnight with 10% aqueous Na_2CO_3 , continuously extracted with MeOH and filtered yielded 2.30 g.

2-dibenzamido-5-benzoyloxy- α -pyridine benzoate, needles, m. 182-3° (MeOH). VII from 1.38 g. $\text{p-O}_2\text{NC}_6\text{H}_4\text{NH}_2$ neutralized with NaOAc , treated at 25° with 0.85 g. VI in 50 cc. H_2O , kept overnight, and filtered gave 1.78 g. crude product; a 31-mg. sample in 2 cc. EtOH chromatographed on 3 g. Al_2O_3 yielded 5.5 mg. 3-hydroxy-2-(p -nitrobenzeneazo)pyridine (IX), red needles, m. 234-5° (MeOH); the chromatogram of a similar run in alkaline solution gave 13.4% IX . IX (40 mg.) reduced and treated in

aqueous

NaHCO_3 with BzCl gave the $\text{N},\text{N},\text{O}$ -tri-Bz derivative (X) of 2-amino-3-hydroxypyridine (XI). $\text{XI} \cdot \text{HBr}$ (500 mg.) in aqueous NaHCO_3 shaken with 1 cc. BzCl yielded 900 mg. X , needles, m. 169-70° (MeOH). X hydrolyzed with $\text{KOH}-\text{MeOH}$ yielded the mono-Bz derivative of XI , needles, m. 95-6°; picrate, yellow needles, m. 237-8° (EtOH). II (7.0 g.) in 20 cc. 48% HBr refluxed 3 hrs. and concentrated in vacuo, the sirupy residue dissolved in a small volume of EtOH and diluted with Et_2O gave 5.7 g. 2-amino-5-hydroxypyridine-HBr ($\text{XII} \cdot \text{HBr}$), m. 120-5°. $\text{XII} \cdot \text{HBr}$ dissolved in aqueous NaHCO_3 containing a few mg. $\text{Na}_2\text{S}_2\text{O}_4$ and the product

isolated

with Et_2O gave XIII , needles, m. 116-17° (MeOH-C₆H₆); picrate, yellow needles, m. 225-7° (decomposition). II hydrolyzed with concentrated HCl yielded $\text{XIII} \cdot \text{HCl}$, needles, m. 125-6° (EtOH-Et₂O). $\text{XIII} \cdot \text{HBr}$ in 20 cc. 20% H_2SO_4 treated with cooling and stirring with 4.5 g. NaNO_2 in 5 cc. H_2O gave 1.75 g. 3,6-dihydroxy-2-nitrosopyridine (XIII), bright red needles, decomposing 210° (H_2O), pKa 8.4 (H_2O). $\text{XIII} \cdot \text{HBr}$ (500 mg.) treated with 3 cc. cold concentrated H_2SO_4 and then with 170 mg. NaNO_2 , stirred 10 min., heated, cooled, poured onto ice, neutralized with solid NaHCO_3 , and treated with 1 cc. BzCl , and the product isolated with Et_2O yielded 550 mg. 2,5-dihydroxypyridine benzoate (XIV), needles, m. 187-9° (C₆H₆). XIV (45 mg.) in 1 cc. 48% HBr refluxed 0.5 hr., cooled, diluted with H_2O , washed with Et_2O , neutralized with NaHCO_3 , and extracted with 1:1 C₆H₆-EtOH, the extract distilled, and the resulting pale yellow glass

crystallized

from EtOH yielded 15 mg. 2,5-dihydroxypyridine (XV), needles, m. 245-7° (EtOH). XIV (100 mg.) hydrolyzed with HBr and evaporated, the residual crude $\text{XV} \cdot \text{HBr}$ dissolved in 20% H_2SO_4 , and the solution treated at 15-20° with 75 mg. NaNO_2 gave XIII . XIII (200 mg.) in 4 cc. concentrated HCl and 4 cc. EtOH treated with 500 mg. SnCl_2 , warmed on the water bath, and concentrated to half-volume gave 190 mg. 2-amino-3,6-dihydroxypyridine-HCl ($\text{XVI} \cdot \text{HCl}$), pale yellow needles; it darkened rapidly in air. A sample of $\text{XVI} \cdot \text{HCl}$ added to aqueous NaHCO_3 gave a brilliant indigo precipitate from a

deep blue

solution $\text{XVI} \cdot \text{HCl}$ (15 mg.) in 2 cc. C₅H₅N treated with 3 drops BzCl , warmed briefly, poured into iced HCl , and filtered gave 20 mg.

2-benzamido-3-benzoyloxy-6-pyridone, needles, m. 243-4°

(CHCl₃-EtOH). 3-Hydroxy-4-methyl-5-phenylpyridine (3.2 g.) in 100 cc. H_2O containing 1 equivalent NaOH treated with 0.017 mole VII , stirred 1 hr., acidified, and filtered, the residue (6.83 g.) extracted with C₆H₆ in a Soxhlet apparatus, and the insol. residue (3.9 g.) recrystd. from EtOH gave 5-hydroxy-3-phenyl-4-methyl-2-(p -nitrobenzeneazo)pyridine (XVII), stout red needles, m. 261-9° (decomposition) (EtOH); the extract evaporated yielded 3-hydroxy-4-methyl-5-phenyl-2-(p -nitrobenzeneazo)pyridine (XVIII), golden-red laths, m. 230-5°. XVIII (1.77 g.) in 150 cc. AcOH hydrogenated over 0.25 g. 10% Pd-C, treated with HBr , and filtered, the

residue extracted with H₂O, and the extract treated with NaOH and BzCl gave
1.83

g. p-C₆H₄(NHBz)₂; the AcOH filtrate evaporated, the residue treated with NaOH and BzCl, and the product isolated with Et₂O gave 2.80 g. N,N,O-tri-Bz derivative (XIX) of 2-amino-3-hydroxy-4-methyl-5-phenylpyridine (XX), needles, m. 182°. XIX (250 mg.) and 500 mg. KOH in 6 cc. 80% MeOH refluxed 0.5 hr., the MeOH evaporated, the residue diluted with H₂O, acidified with dilute

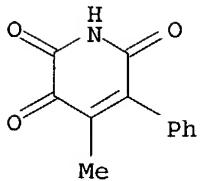
acid, and neutralized with NaHCO₃, and the precipitate treated with picric acid gave the picrate of the Bz derivative (XXI), of XX, m. 213°. XIX (280 mg.) in 5 cc. 48% HBr refluxed 1 hr., cooled, washed with Et₂O, and neutralized with NaHCO₃ gave 125 mg. (crude) XX, needles, m. 210° (decomposition), pKa 6.05, 9.9 (50% MeOH); picrate, golden needles, m. 260° (decomposition) (EtOH). XX with BzCl in C₅H₅N gave the 2-benzamido-5-benzoate ester, needles, m. 195-6°. XX (25 mg.) and 50 mg. recrystd. picryl chloride heated 10 min. on the water bath, cooled, and poured into H₂O gave 20 mg. 7,9-dinitro-4-methyl-3-phenyl-10-pyrido[3.2-b] [1.4]benzoxazine, red prisms, m. 196° (MeOH). XVII (1.94 g.) hydrogenated in the usual manner and the crude aminohydroxypyridine benzoylated gave a noncryst. polybenzoyl derivative which treated directly with KOH-MeOH yielded the N-Bz derivative (XXII) of 2-amino-5-hydroxy-4-methyl-3-phenylpyridine (XXIII), needles, m. 216-17° (CHCl₃-Et₂O). XXII (325 mg.) in 3 cc. concentrated H₂SO₄ warmed 10 min., poured onto ice, washed with Et₂O, neutralized with NaHCO₃, and filtered gave 205 mg. (crude) XXIII, rods, m. 190-5° (decomposition), pKa 6.05, 10.25 (50% MeOH). XXII in Et₂O treated with C₅H₅N and BzCl and evaporated, and the oily residue triturated with aqueous NaHCO₃ yielded the 2-benzamido-5-benzoate ester (XXIV) of XXIII, needles, m. 199-200° (EtOAc). XXIII benzoylated in the usual manner and then hydrolyzed with KOH-MeOH gave XXIII. XXIII (100 mg.) in 2.5 cc. 60% H₂SO₄ treated at -5° with 35 mg. NaNO₂, stirred at 0° until the gas evolution ceased, warmed to 50°, cooled, neutralized with K₂CO₃, and filtered yielded 60 mg. 2,5-dihydroxy-4-methyl-3-phenylpyridine (XXV), needles, m. 250-60° (MeOH). XXIII (850 mg.) in 20 cc. 20% H₂SO₄ treated at room temperature with 1.20 g. NaNO₂ in 7 cc. H₂O, stirred 10 min., and filtered gave 650 mg. 6-NO derivative (XXVI) of XXV, golden-red prisms, m. 250-3° (EtOH), pKa below 2, 8.65 (50% MeOH); the mother liquor from the crude XXVI extracted with Et₂O yielded 70 mg. 2-hydroxy-4-methyl-5-phenyl-1-azaquinone (XXVII), cream-colored needles; the Et₂O-extracted aqueous acid solution

neutralized with solid NaHCO₃ yielded 110 mg. (crude) 6-NO derivative of XXIII, yellow needles, m. above 280° (Me₂CO). XXVI (150 mg.) in 2.5 cc. 40% H₂SO₄ heated on the steam bath to solution, cooled, and neutralized with solid NaHCO₃, and the product isolated with Et₂O gave 60 mg. XXVII, pale yellow needles, m. 160-1° (H₂O); the E₀ value for the reaction was -0.40 v. against a calomel electrode. XXV (10 mg.) in 0.5 cc. 20% H₂SO₄ treated with 20 mg. NaNO₂ and kept 2 days at room temperature yielded 5.5 mg. XXVII, m. 159-60°. XXVI (250 mg.) in 7 cc. 40% H₂SO₄ refluxed 1 hr. and steam distilled, and the product isolated from the distillate with Et₂O gave 75 mg. 3-methyl-4-phenylmaleic anhydride (XXVIII), needles, m. 95-6° (sublimed). XXVII (21 mg.) and 10.2 mg. o-C₆H₄(NH₂)₂ in 2 cc. AcOH warmed 1 hr. on the water bath and evaporated, and the residue treated with EtOH gave 2-hydroxy-4-methyl-3-phenylpyrido[2.3-b]-quinoxaline, pale yellow needles, m. 275° (AcOH). XXVII (50 mg.) in 3 cc. Ac₂O heated 1 hr. at 75° with 500 mg. Zn dust, filtered, and evaporated gave 55 mg. 2,3,6-trihydroxy-4-methyl-5-phenylpyridine triacetate, prisms, m. 106-7° (Et₂O-hexane).

IT 10137-16-3, 2,3-Pyridinedione, 6-hydroxy-4-methyl-5-phenyl-
(preparation of)

RN 10137-16-3 CAPLUS

CN 2,3-Pyridinedione, 6-hydroxy-4-methyl-5-phenyl- (6CI, 8CI) (CA INDEX
NAME)

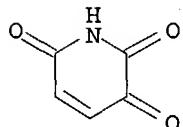


ACCESSION NUMBER: 1960:34227 CAPLUS
 DOCUMENT NUMBER: 54:34227
 ORIGINAL REFERENCE NO.: 54:6695f-i,6696a-i,6697a-h
 TITLE: Heterocyclic studies. VII. The preparation and reactions of 2-amino-5-hydroxypyridines; the formation of an azaquinone
 AUTHOR(S): Moore, James A.; Marascia, Frank J.
 CORPORATE SOURCE: Univ. of Delaware, Newark
 SOURCE: Journal of the American Chemical Society (1959), 81, 6049-56
 DOCUMENT TYPE: Journal
 LANGUAGE: Unavailable

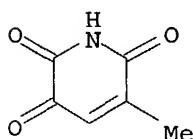
L3 ANSWER 12 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
 AB 2-Hydroxy-5-aminopyridine (I) HCl salt (3.0 g.) in 25 cc. conductivity H₂SO₄ warmed gently until the HCl evolution ceased, cooled, poured onto 50 g. ice, treated rapidly with stirring with 1.1 g. KBrO₃ in 25 cc. H₂O below 5°, kept several hrs. at 3-5°, and filtered, the residue washed with ice H₂O, dried, extracted 1 week with absolute EtOH in a Soxhlet extractor, and the insol. residue recrystd. from HCONMe₂ and molten AcNH₂ gave 0.80 g. 1-aza-6-hydroxy-2,5-benzoquinone (II), purple-brown microcrystals with a metallic sheen, decompose above 300° (indefinite); the EtOH extract concentrated and cooled gave 0.40 g. purple-brown rhombs, decompose above 300°, which appeared to be identical with the insol. material except for the solubility properties; both fractions dissolved in alkali with an intense blue color which faded rapidly with absorption of O and evolution of NH₃; the alkaline solution finally turned red-yellow and fluoresced in ultraviolet light. 2-Hydroxy-3-aminopyridine (III).HCl (1.0 g.) in 10 cc. concentrated H₂SO₄ warmed until the evolution of HCl ceased, treated at -20° with 0.3 g. CrO₃ in 5 cc. concentrated H₂SO₄ with stirring, kept 2 hrs. at -20°, warmed slowly at room temperature, poured onto ice, and filtered, and the purple precipitate (0.25 g.) extracted in the usual manner with EtOH gave a soluble and an insol. fraction of II. II (soluble or insol. fraction) (0.1 g.) and 0.5 g. Zn dust heated with 3 cc. Ac₂O on the steam bath, the pale yellow, pale blue fluorescing solution filtered hot and evaporated in vacuo, and the residue recrystd. from EtOH gave 0.15 g. 2,3,6-triacetoxypyridine, pale cream platelets, m. 159° (from EtOH). 2,3-Dihydroxypyridine oxidized with MnO₂ or with KBrO₃ in the usual manner gave soluble and insol. II and a trace of an unidentified light yellow solid, m. above 300° (decomposition). 3-Amino-4-hydroxypyridine HCl salt oxidized in the usual manner gave only intractable red tars, even with insufficient amts. of oxidant at -50° 3-Nitro-4-chloropyridine (3.2 g.) and 2.6 g. NaN₃ in 23 cc. MeOH and 2 cc. H₂O warmed 10 min. at 35-40°, filtered, concentrated to 1/2 the original volume, and cooled gave 2.55 g. 3-nitro-4-azidopyridine, pale yellow rods, m. 89° (decomposition); it decomposed when heated a few sec. above 90° with a violet gas evolution, and formed a yellow oil which changed rapidly into a dark insol. residue, did not melt or decompose below 300°. 2-Amino-5-methylpyridine nitrated, diazotized, and hydrolyzed gave 38% 2-hydroxy-3-nitro-5-methylpyridine (IV), m. 253-5°. IV (30.8 g.) in 400 cc. 2% AcOH warmed on the H₂O bath with occasional swirling with excess Fe filings, neutralized with CaCO₃, and filtered hot, the residue

washed with the hot H₂O, the combined filtrate treated with stirring and cooling with excess Ac₂O and filtered and the filter residue recrystd. from EtOH gave 22.2 g. 2-hydroxy-3-acetamido-5-methylpyridine (V), leaflets, m. 253° with a change to needles at about 220°. 2-Amino-3-methylpyridine nitrated, diazotized, and hydrolyzed yielded 71% 2-hydroxy-3-methyl-5-nitropyridine which reduced and acetylated in the usual manner gave 69% 2-hydroxy-3-methyl-5-acetamidopyridine (VI), needles, m. 247° (from EtOH). V (3.0 g.) in 50 cc. 16% H₂SO₄ heated 5 min. at 95-100°, cooled to 25°, treated with 1.0 g. KBrO₃ in 25 cc. H₂O, kept below 40°, then 2 hrs. at room temperature, refrigerated 24 hrs., and filtered, and the residue (0.7-1.0 g.) washed with cold H₂O, dried, and recrystd. from MeOH gave impure quinhydrone (VII) of 3-aza-4-hydroxy-5-methyl-1,2-benzoquinone, birefringent green-gray leaflets, decompose above 300° (indefinite); it dissolved in alkali with an intense blue color which changed after a few hrs. to yellow-red. VII (2.0 g.) and 5.0 cc. PhNHNH₂ in the min. amount of 10% AcOH heated 6 hrs. on the H₂O bath and cooled gave 1.2 g. monophenylhydrazone, brown-red needles, m. 254° (decomposition), changing to yellow-red at 210°. VI oxidized in the usual manner gave the quinhydrone, green-gray platelets, decompose above 300°; deep purple in dioxane changing to red-yellow with the simultaneous formation of a green-blue fluorescence to ultraviolet light; soluble in alkali with decomposition and green-blue fluorescence.

IT 13445-17-5, 2,5-Pyridinedione, 6-hydroxy- 17999-44-9,
2,3-Pyridinedione, 6-hydroxy-5-methyl-
(and derivs.)
RN 13445-17-5 CAPLUS
CN 2,3,6(1H)-Pyridinetrione (9CI) (CA INDEX NAME)



RN 17999-44-9 CAPLUS
CN 2,3,6(1H)-Pyridinetrione, 5-methyl- (9CI) (CA INDEX NAME)



ACCESSION NUMBER: 1957:90711 CAPLUS
DOCUMENT NUMBER: 51:90711
ORIGINAL REFERENCE NO.: 51:16458d-i,16459a-c
TITLE: Azaquinones. I. Oxidation of certain hydroxy- and aminopyridines
AUTHOR (S): Boyer, J. H.; Kruger, S.
CORPORATE SOURCE: Tulane Univ., New Orleans, LA
SOURCE: Journal of the American Chemical Society (1957), 79,
3552-4
CODEN: JACSAT; ISSN: 0002-7863
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable
OTHER SOURCE (S): CASREACT 51:90711

⇒

ANSWER 3 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1995:629937 CAPLUS
DOCUMENT NUMBER: 123:156260
ENTRY DATE: Entered STN: 22 Jun 1995
TITLE: Silver halide photographic material with greatly improved residual color on super rapid processing
INVENTOR(S): Yamada, Taketoshi; Oonishi, Akira; Usagawa, Yasushi
PATENT ASSIGNEE(S): Konishiroku Photo Ind, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 50 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
INT. PATENT CLASSIF.:
MAIN: G03C001-83
SECONDARY: C09K003-00
CLASSIFICATION: 74-2 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06317878	A2	19941115	JP 1993-108410	19930510
PRIORITY APPLN. INFO.:			JP 1993-108410	19930510
PATENT CLASSIFICATION CODES:				
PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES		
JP 06317878	ICM	G03C001-83		
	ICS	C09K003-00		

GRAPHIC IMAGE:

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

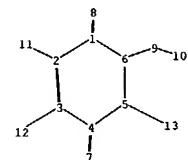
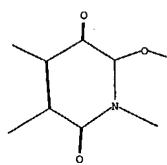
ABSTRACT:

The title photog. material has ≥ 1 layer containing compound I-V ($X_1 = O, S, SO_2, NR_1(R_1 = H, alkyl, aryl, heterocycl)$; $L_{1-5} = \text{methine}$; $n_{1-5} = 0-1$; $Z = \text{non-metallic atoms required to form aromatic ring}$; $Y = \text{alkylsulfonyl, arylsulfonyl, aryloxycarbonyl, carbamoyl}$; $R_2 = \text{aryl}$; $R_3 = R_1$; when $R_3 = \text{aryl}$, $R_4 = \text{aryloxycarbonyl, acylamino, ureido, carboxy, carbamoyl, cyano, hydroxy, alkoxy, aryloxy, amino, sulfamoyl, sulfone amido}$; when $R_3 = H$, $alkyl, heterocycl$, $R_4 = H, alkyl, aryl, heterocycl, alkoxy carbonyl or group defined above for R_4$; $R_{5-7} = \text{organic group}$; $X_{2-4} = O, S$; $R_8, R_9 = H, alkyl, aryl, heterocycl$; each compound of I-V containing at least 1 of carboxy, sulfone amido, or sulfamoyl).

SUPPL. TERM: photog material specific compd
INDEX TERM: Photographic films
(containing specific compound)
INDEX TERM: 71620-29-6 160816-96-6 167014-64-4 167014-65-5
167014-66-6 167014-67-7 167014-68-8 167014-69-9
167014-70-2 167014-71-3 167014-72-4 167014-73-5
167014-74-6 167014-75-7 167014-76-8 167014-77-9
167014-78-0 167014-79-1 167014-80-4 167014-81-5
167014-82-6 167014-83-7 167014-84-8 167014-85-9
167014-86-0 167014-87-1 167014-88-2 167014-89-3
167014-90-6 167014-91-7 167014-92-8 167014-93-9
167014-94-0 167014-95-1 167014-96-2 167014-97-3
ROLE: DEV (Device component use); USES (Uses)
(contained in photog. material for greatly improving residual color on super rapid processing)
INDEX TERM: 167015-01-2P

ROLE: SPN (Synthetic preparation); PREP (Preparation)
(prepared for photog. material)
INDEX TERM: 98-01-1, Furfural, reactions 64542-27-4 90721-27-0,
5-Benzofurancarboxylic acid 167014-98-4
167014-99-5 167015-00-1
ROLE: RCT (Reactant); RACT (Reactant or reagent)
(preparing specific compound for photog. material)

=>



chain nodes :

7 8 9 10 11 12 13

ring nodes :

1 2 3 4 5 6

chain bonds :

1-8 2-11 3-12 4-7 5-13 6-9 9-10

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6

exact/norm bonds :

1-2 1-6 1-8 2-3 3-4 4-5 4-7 5-6 5-13 6-9 9-10

exact bonds :

2-11 3-12

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:CLASS 8:CLASS 9:CLASS 10:CLASS
11:CLASS 12:CLASS 13:CLASS

13